

ACTION DESCRIPTION MEMORANDUM
FOR
SURFACE WATER MANAGEMENT AT ROCKY FLATS

EG&G Rocky Flats, Inc.
Rocky Flats Plant

Operating Contractor for
U.S. Department of Energy

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1.0 PURPOSE

The purpose of this Action Description Memorandum (ADM) is to provide sufficient information to permit a reasonable determination of the level of NEPA documentation required to comply with DOE Orders 5440.1C and AL 5440.1B, "Implementation of the National Environmental Policy Act (NEPA)."

2.0 PROPOSED ACTION

Discharge of surface water from the Rocky Flats Plant has become an issue with significant interest to state and local officials and the neighboring public. A Predecisional Draft Surface Water Management Plan (submitted to the DOE on October 1, 1990) has been prepared to discuss various options for managing the plant's water discharges. In reviewing the plan, it should be noted that all current water discharges from the Rocky Flats Plant are covered by a federal permit.

2.1 Need for the Action

Increasing public interest has directed considerable EG&G and DOE management attention on water management at Rocky Flats. Recent State of Colorado actions have lowered the allowable limit for contaminants in Rocky Flats water to far below any other discharge limit in the state, and may force the limit to below what is consistently achievable, or even technically feasible. The pressure on Rocky Flats to develop a management plan is further exacerbated by the opposition of local communities, notably Broomfield and Westminster, to the release, beyond plant boundaries, of all surface water flows that would eventually enter local water supplies, i.e., Standley Lake and Great Western Reservoir. An overall management program, with new facilities as required, is necessary if Rocky Flats is to continue to operate and meet State and EPA regulatory requirements, and to meet the needs created by public perceptions.

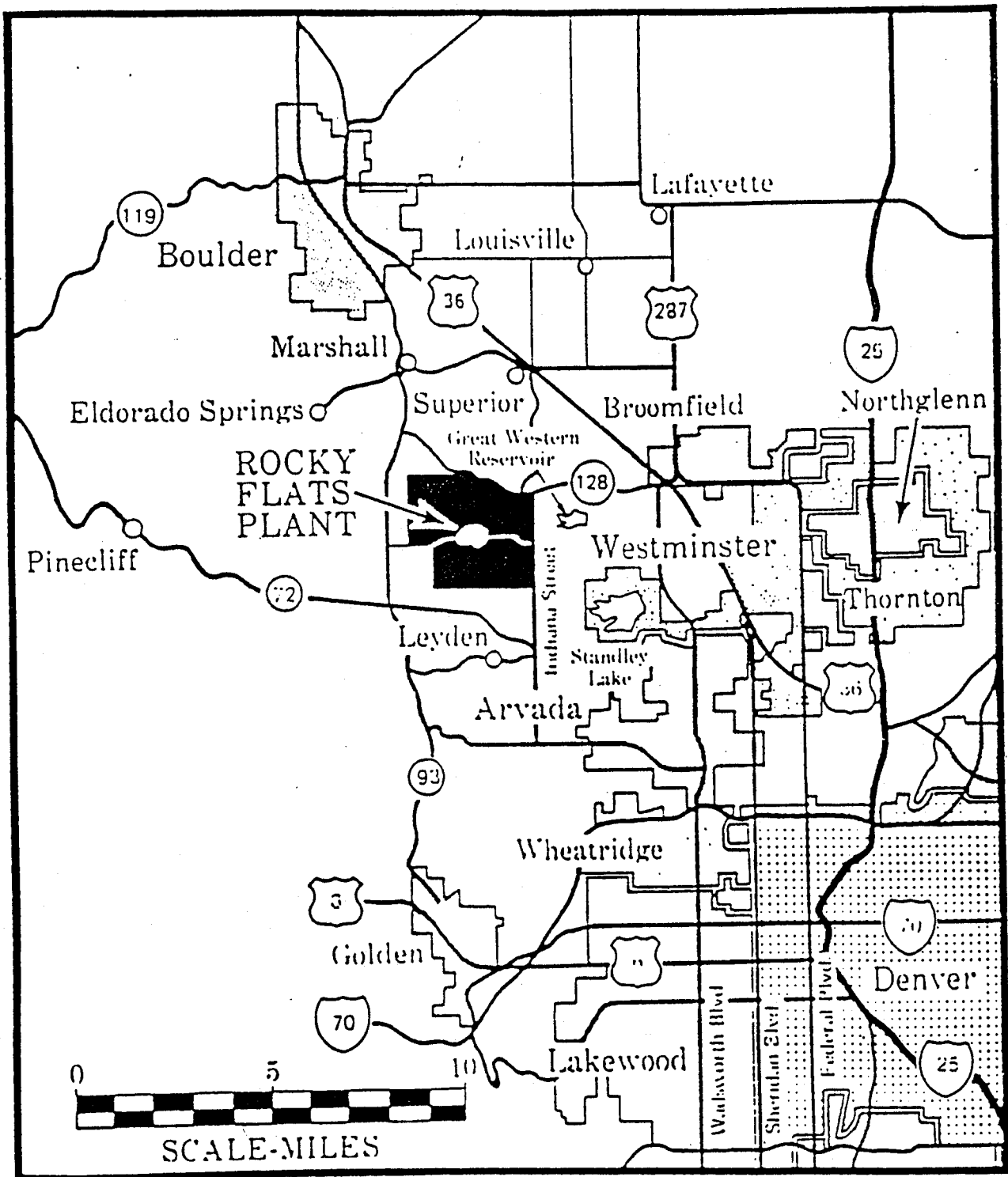
2.2 Location of the Action

The Rocky Flats Plant is located in northern Jefferson County, approximately 16 miles northwest of downtown Denver, Colorado. Two local water reservoirs of particular interest in the plan are the Great Western Reservoir, east of the plant, and Standley Lake, southeast of the plant. The proposed action and alternatives discussed in the Surface Water Management Plan (SWMP) and in this ADM will occur throughout the plant, the buffer zone, and at various off-site locations in several Colorado counties. Refer to Figures No. 1 and 2.

2.3 Concise Description of the Proposed Action

The proposed action is a hybrid plan incorporating changes to municipal water supplies and various projects to decrease the amount of water discharged by the Rocky Flats Plant. Refer to Section 3.4.1 for further details.

Figure 1
LOCATION OF ROCKY FLATS AND SURROUNDING COMMUNITIES



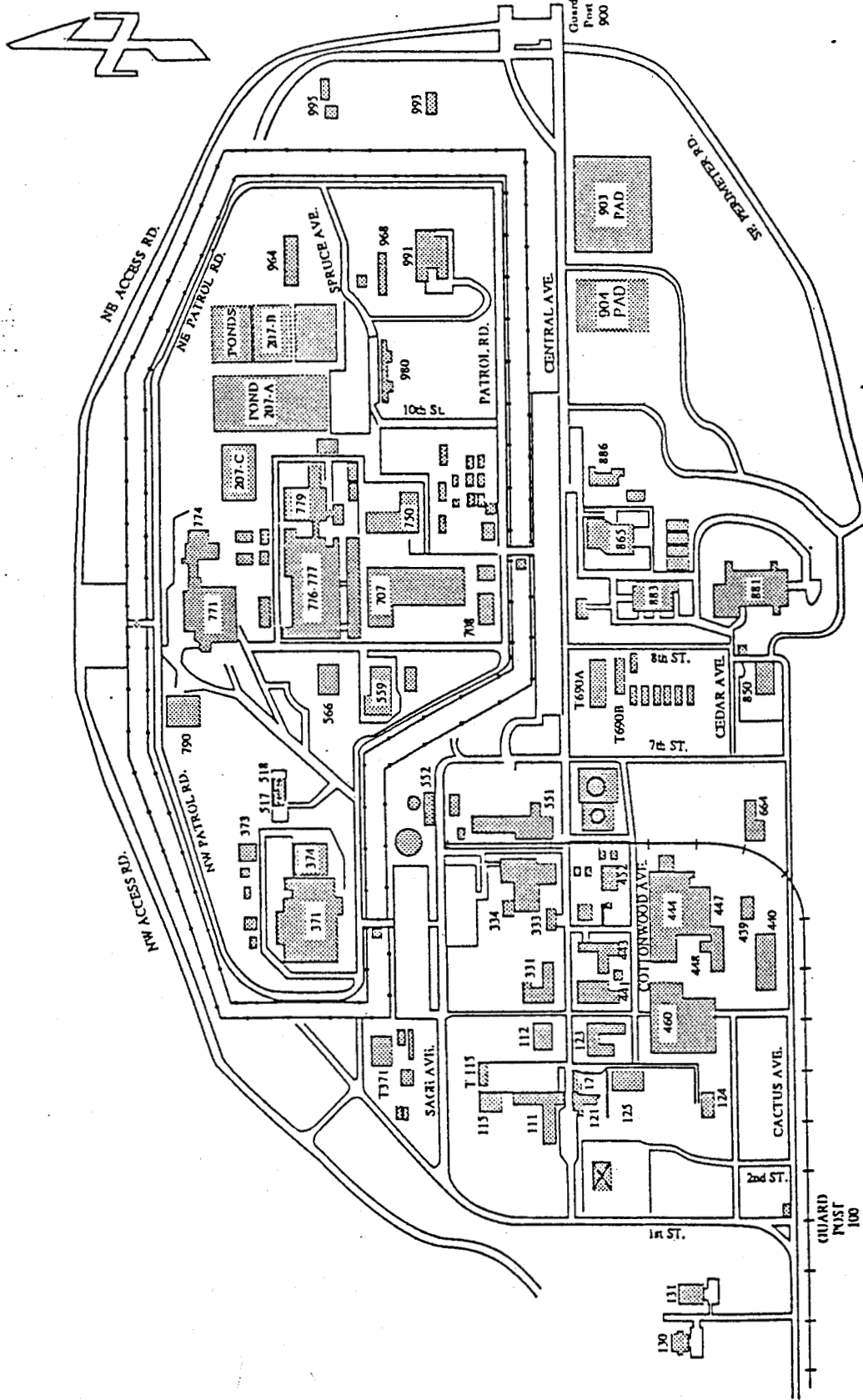
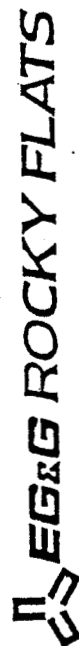


Figure 2

Rocky Flats Plant Area Plot Plan

Project
Location



April 1990

2.4 Surface Water Management Plan

The proposed action and alternatives summarized herein are more fully described in the SWMP. The SWMP evaluated four categories of possible actions:

- o Maintain the Status Quo (No-Action) by complying with regulatory requirements through use of existing systems;
- o Purchase of new water rights for the City of Broomfield (which may or may not allow use of Great Western Reservoir to receive Rocky Flats water) combined with conveyance of water off-site via pipelines (possibly ditches and/or channels);
- o On-site projects to hold water for treatment and evaporation; and
- o Hybrid plans combining elements of the conveyance and on-site options.

The actions were evaluated against six criteria:

- o Technical feasibility;
- o Environmental risk to water quality and the health of downstream and adjacent users;
- o Usefulness as a long-term solution;
- o Regulatory compliance and adaptability to foreseeable changes;
- o Cost effectiveness; and
- o Public Confidence.

A fifth category of actions, listed in the plan as "other", were rejected without detailed study as not meeting the six criteria.

A brief description of each category of action and the potential environmental impacts is included below. Many of the elements discussed can be combined in a variety of ways, and a full discussion of all permutations is not included.

3.0 ALTERNATIVES AND THEIR POTENTIAL ENVIRONMENTAL IMPACTS

The three categories of alternatives and the "no action" alternative are discussed below. For further details, see the previously forwarded Surface Water Management Plan. The alternatives are pre-conceptual at this time, and details of cost, construction, and potential environmental impacts are correspondingly rough. Each of the alternatives (excluding the no-action) has the potential for environmental impacts, and further evaluation is needed to determine the levels of impact. Further, some options will require additional research to determine the feasibility of using the option. For example, further development of treatment processes to remove sub-picocurie concentrations of radiological contamination is needed before the conclusion can be drawn, with certainty, that any alternative relying on the removal of radiological contamination is feasible. At this time the proposed action is a hybrid plan (refer to Section 3.4) that combines features of an option to convey water being discharged off-site around local water supplies (refer to Section 3.2) and a "zero-discharge" option which would eliminate the discharge of either Rocky Flats water or contaminants (contaminant-free water would be discharged only) to drainages downstream of the plant (refer to Section 3.3).

3.1 No Action

The "no action" alternative would maintain the status quo, with treatment and discharge per existing permits. Occasional problems have been encountered at Rocky Flats when the water to be discharged presented concerns about its quality, and when water levels exceeded the design limit of the ponds in use, and these problems would continue. Potential enhancements of the status quo option, including

additional monitoring or development of emergency water sources, has been resisted by downstream users. Further, the State's authority, and past practice, to lower water discharge limits for Rocky Flats could easily eliminate this alternative.

Since the ponds and treatment equipment are already installed, the environmental impacts of "no action" is expected to be minimal. No health effects are known to occur at the levels of contaminants discharged by Rocky Flats; however, local governments have expressed fear of the routine, permitted discharges, and concerns over potential accidents. No new construction would be needed, though maintenance and minor modifications would likely be needed to maintain operation of the ponds and treatment units. The dams may experience sufficient wear-and-tear over the next few years to produce failure if no actions are taken to either strengthen (currently being considered) or replace the dams. If discharge limits are lowered by the State, additional treatment or other equipment would probably be needed, and would be identified at the time.

3.2 Conveyance of Water Off-Site

For this alternative, water currently discharged from Rocky Flats into plant drainages would be conveyed off-site via pipelines. Two destinations for the water have been considered: downstream of Great Western Reservoir and Standley Lake, and to various off-site Sewer Treatment Plants. The City of Westminster actively supports the concept of routing around Standley Reservoir all water that might be impacted by Rocky Flats.

Constructing the pipelines would require excavation, possibly including tunneling under highways and roads. Rough costs for the pipelines to by-pass the reservoirs range from \$20 to 35 Million, with the pipelines to convey water to Sewage Treatment Plants a little less expensive. Additional costs could be incurred in obtaining rights-of-way and other aspects of the project not yet identified at this conceptual stage. Sewage Treatment Plants set pre-treatment standards for incoming industrial waste water, and the standards would need to be negotiated. However, pre-treatment standards are less stringent than National Pollutant Discharge Elimination System (NPDES) standards. Therefore, planned upgrades to the existing STP may be reduced or eliminated. The plant's NPDES permits would require modification to reflect the new discharge point.

Legal issues and obligations with respect to water rights must be evaluated. If DOE were required to replace the water lost to the reservoirs by the conveyance downstream, new suitable water rights would likely need to be obtained by DOE.

In addition to the fiscal and engineering issues, communities through which the pipeline would pass are likely to be interested in providing input, and downstream users could also have concerns.

Environmental impacts from the construction of the pipelines would include noise, dust, and traffic typical of any construction project. Traffic flows would likely be interrupted when tunnels under roads were constructed. If the pipelines can follow existing irrigation ditches and roads, no additional roads would need to be constructed. Some impact on small sections of wetlands and/or floodplains on and off-site may occur due to construction, but can likely be mitigated by careful design and construction practices. Potential impacts due to loss of water flow in the by-passed sections, or increased flow at the new discharge point have not been evaluated.

The effect on local fears is difficult to evaluate. Users of the Great Western Reservoir and Standley Lake are likely to feel their risks from Rocky Flats operations are lessened if the reservoirs are by-passed. Reactions of communities downstream of the new discharge have not been evaluated. The overall effect on the public as a whole has not been evaluated.

3.3 On-Site Actions to Reduce or Eliminate Discharges to Off-Site Drainages ("Zero Discharge")

The "Zero Discharge" option can take the form of zero discharge of contaminants (contaminant-free water would be discharged) and/or zero discharge of water. The first option, eliminating the discharge of contaminants, would be accomplished through use of water treatment processes to remove organic, inorganic, and radiological constituents from the water. Following treatment, the water would be discharged downstream of the plant. The second option, eliminating the discharge of water, would require that all of the water that would normally pass the plant boundary be returned to the plant for reuse or disposal. Variations of this option would include zero discharge of water that contacts the main facilities only and zero discharge of all water that enters the buffer zone except for the northwest region. Future agreements between DOE and regulatory agencies will determine which of the options is selected.

3.3.1 Zero Discharge of Contaminants

This option would provide a method for discharging water downstream of the plant while at the same time reducing the concentration of organic, inorganic, and/or radiological contaminants (if present) to standards established by the State and Federal agencies. If the standards are met and local communities accept the discharges, the need for piping, new reservoirs, and/or diversions would be eliminated. However, it should be noted that the cities of Broomfield and Westminster have expressed strong opposition to any discharge of water, treated or otherwise, that enters Great Western Reservoir and Standley Lake.

Potential activities include:

- o Upgrade of existing, nonoperating Reverse Osmosis facility;
- o Construction of new pond water treatment plant; and
- o Upgrade existing sanitary treatment plant;

It should be noted that treatment technologies to support this option may need either improvements or development before implementation can occur. This is notable when trying to remove sub-picocurie concentrations of radionuclides from water. Several technologies exist that effectively remove radiological constituents, but at very small concentrations the processes may prove ineffective.

3.3.2 Zero Discharge of Water

Several activities will be evaluated for eliminating the downstream discharge of water beyond the plant boundary. Although this option would probably be viewed favorably by the local communities, the loss of water to Great Western Reservoir and Standley Lake could produce a water rights issue. Also, the use of water to extinction that was purchased from the Denver Water Board will produce a water rights issue.

Therefore, it is possible that the quantity of water lost through zero discharge would have to be replaced.

Potential activities include:

- o Construction of new evaporation ponds;
- o Construction of storage reservoirs to control runoff;
- o Construction of new treatment facilities to remove contaminants from water;
- o Recycling of surface water into the process and/or sanitary water systems; and
- o "Dam hardening" to strengthen existing dams on the ponds and enhance the storage capacity.

3.3.3 On-site Zero Discharge Impacts

Potential environmental impacts common to both zero discharge options include excavation and pipe trenching activities which produce noise, dust, and traffic typical of any construction project. Depending on the specific location of these activities, wetlands and/or floodplains could be impacted, but the impacts could likely be mitigated by careful design and construction practices. Constructing new and/or upgrading existing treatment facilities could produce additional wastes requiring treatment and/or disposal. For example, the reverse osmosis unit would produce an additional brine waste stream. Other potential impacts include commitment of acreage to a specific use which may be in conflict with future projects which could have a need for the same acreage, or development of Buffer Zone acreage that was designated for no development in the Environmental Impact Statement that accompanied purchase of the Buffer Zone. A potential beneficial impact could be creation of new wetlands caused by construction of additional storage facilities or specifically developed as a water management tool.

3.4 Hybrid Plans Combining Elements of Both

The hybrid options include elements of off-site conveyance of water and on-site "Zero Discharge" efforts, as discussed above. One element in the hybrid options that was not discussed in the water conveyance or zero discharge alternatives is to discontinue use of Great Western Reservoir as a water source (this option would probably be combined with construction of a diversion around Standley Lake). This change would require the City of Broomfield to access other water rights.

3.4.1 Selected Alternative/Proposed Action

As noted earlier the proposed action is a hybrid plan that combines features from both the conveyance and zero-discharge alternatives. The first part of the action, which is favored by the local communities, is called Option B. This option includes the following elements: the removal of Great Western Reservoir as the source of the City of Broomfield's water supply; construction of a 100-year detention dam (capacity 550 acre feet) on Woman Creek; transfer of water in Woman Creek to Walnut Creek and subsequently Great Western Reservoir; construction of a 100-year diversion canal north of Standley Lake; installation of a seepage pump-back system at the toe of Great Western Reservoir; installation of the Kinnear Ditch pipeline to divert Woman Creek water around the south side of the plant; and construction of the Pond C-2 interceptor trench to collect treated groundwater and runoff which is then returned to Pond C-2. Costs are estimated at approximately 81 Million dollars. (Costs were defined by the cities and have not yet been independently verified by DOE or its contractors.) The second part of the action is zero-discharge of plant water. The elements of this part are undefined at this time but will probably include some of the zero-discharge features discussed above. Costs are roughly estimated at 100 Million dollars for the zero-discharge activities.

3.4.2 Selected Alternative Impacts/Proposed Action

One of the key impacts associated with the first part is loss of the Broomfield water supply. Broomfield would have to seek an alternative water supply (with associated water rights issues) while building a pipeline to replace Great Western Reservoir. The replacement project may or may not require construction of a new reservoir. Possible water sources include the Windy Gap Project near Fort Collins, Colorado and the Denver Water Department. Environmental impacts would be those typically associated with development of new water sources. Impacts to downstream users of Woman, Walnut, and Big Dry Creeks may include loss of water and/or flood control. The change of use of Great Western Reservoir may also lead to Rocky Flats having the responsibility for the cleanup of the reservoir and possible repair or replacement of the dam if the dam is found to be deficient. Since water may not be discharged from the reservoir a stagnant lake could also be created. Another concern is that EPA may require an evaluation of

the diversion ditches as they relate to closure of Rocky Flats as a Superfund site. Impacts from zero-discharge option are discussed in Section 3.3, and could include impacts to wetlands.

3.5 Cumulative Impacts

Several of the activities under the different alternatives will potentially have the same types of impacts. Extensive piping and pumping to transfer water between sections of the plant/buffer zone accompanied by excavation for piping would be needed, wetlands and floodplains may be adversely affected, new sources of water to replace that lost to Great Western Reservoir and Standley Lake would have to be found, retrofitting buildings to accept new sources of water could be required, and extensive earth movement may be necessary to construct new impoundments. However, the cumulative impacts that could result from implementing the Surface Water Management Plan can not be evaluated until the specific combination of actions has been bounded. A general idea, however, can be obtained by reviewing the alternatives described in this ADM.

Other activities on plant although not directly related to surface water management could be affected by the SWMP alternatives, specifically, the production of additional wastes. Many of the technologies (e.g., reverse osmosis, filtration, and ion exchange) generate waste, that will require disposal. It is likely that these wastes would be solidified (cemented) prior to storage and disposal. This could put an additional burden on the current cementing process ("Pondcrete") or require a separate facility to solidify the wastes.

The Surface Water Management Plan presents a number of actions that can be combined in a variety of ways. Some temporary actions related to water treatment and management at Rocky Flats have already been proposed to DOE and the NEPA process initiated, or have received NEPA determinations. These include the ADM Treatment of A-4, B-5, and C-2 Ponds (including later amendments and revisions), authorization number 406018, submitted under cover (90-RF-0688) dated February 14, 1990, and EC Pond C-2 Recycle, authorization number EC01490, submitted May 31, 1990.

4.0 Other Documents

A ground water management document also being developed by EG&G. Surface and ground water are both elements of the hydrological cycle. Actions for ground and surface water are likely to interact and the NEPA process may need to address both plans.